National Electric Power Regulatory Authority
Islamic Republic of Pakistan

Registrar

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No.NEPRA/TRF-232/SKHPL-2013/3036-3038
March 28, 2014

Subject: **Determination of the Authority in the matter of Tariff Petition filed by S.K. Hydro (Private) Ltd. for Determination of Generation Tariff in respect of 870.25 MW Suki Kinari Hydropower Project [Case # NEPRA/TRF-232/SKHPL-2013]**

Dear Sir,

Please find enclosed herewith the subject Determination of the Authority (30 pages) in Case No. NEPRA/TRF-232/SKHPL-2013.

2. The Determination is being intimated to the Federal Government for the purpose of notification of the approved tariff in the official gazette pursuant to Section 31(4) of the Regulation of Generation, Transmission and Distribution of Electric Power Act (XL of 1997) and Rule 16(11) of the National Electric Power Regulatory Authority Tariff (Standards and Procedure) Rules, 1998.

3. Please note that only Order of the Authority at para 10 of the Determination along with Annex-I & II needs to be notified in the official Gazette.

Enclosure: As above

28/3/14

(Syed Safeer Hussain)

Secretary
Ministry of Water & Power
'A' Block, Pak Secretariat
Islamabad

CC:

1. Secretary, Cabinet Division, Cabinet Secretariat, Islamabad.
2. Secretary, Ministry of Finance, 'Q' Block, Pak Secretariat, Islamabad.

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY
(NEPRA)
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No. NEPRA/TRF-232/SKHPL-2013

Determination of the Authority

in the matter of

SK Hydro (Private) Limited (SKHPL)

870.25 MW Suki Kinari Hydropower Project

EPC Stage Reference Tariff 2013

NATIONAL ELECTRIC POWER REGULATORY AUTHORITY (NEPRA)

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No. NEPRA/TRF-232/SKHPL-2013
March 28, 2014

Determination of SK Hydro (Private) Limited (SKHPL) of EPC Stage Reference Tariff

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Authority

28/3/14
Maj. Rtd Haroon Rashid
Member

28/3/2014
Habibullah Khilji
Member

28-3-14
Khawaja Muhammad Naeem
Vice Chairman/Member (Tariff)

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Determination of the Authority in the matter of Tariff Petition filed by SK Hydro (Private) Limited for determination of generation tariff in respect of 870.25 MW Suki Kinari Hydropower Project (SKHPL). (Case No. NEPRA/TRF-232/SKHPL-2013)

SK Hydro (Private) Limited filed Tariff Petition for determination of EPC stage generation tariff under Rule 3 of the NEPRA Tariff (Standards & Procedure) Rules 1998 ("Tariff Rules"). The Petition was considered and admitted by the Authority on July 24, 2013. In terms of rule 4(6) read with rule 5 of Tariff Rules, notice of admission and the public hearing was published in the daily newspapers on August 17, 2013, for information and invitation to all the stakeholders for meaningful participation either through comments or becoming a party to the case as intervener. Further in terms of rule 4(%) of Tariff Rules written notices were also sent to the main stakeholders for their participation who were likely to be affected or interested and could assist the Authority in reaching at a just and informed determination. The public hearing was held on September 3, 2013 at NEPRA office Islamabad, which was attended by the representatives of the NTDC, Petitioner, PPIB and other stakeholders.

2. Submissions of the Petitioner.

2.1 SK Hydro (Private) Limited ("SKHPL") is a private limited company registered under the Companies Ordinance, 1984. SKHPL intended to establish a hydropower generation project of about 840 MW installed capacity on Kunhar River, in Kaghan Valley in the eastern part of the Khyber Pakhtunkhwa Province of Pakistan. After completion of due process, SKHPL was granted Generation License bearing No. IGSPL/21/2009 by NEPRA on 27th May, 2009 and is currently a licensee under the NEPRA Act.

2.2 The Petitioner submitted that immediately after the Authority issued its feasibility stage tariff determination on 18th November 2008, the Government of Khyber Pakhtunkhwa filed two Civil Appeals and a Constitution Petition before the Honourable Supreme Court of Pakistan in May, 2009. The Honourable Supreme Court of Pakistan granted stay on 27th May, 2009 and directed the Ministry of Water & Power & NEPRA to maintain 'Status Quo'. The Government of Khyber Pakhtunkhwa eventually decided to unconditionally withdraw the cases. Through its order dated 20 October, 2010, the Honourable Supreme Court of Pakistan dismissed the Civil Appeals as well as Constitution Petition being withdrawn.

2.3 Due to the litigation by the Government of Khyber Pakhtunkhwa, project activities stood suspended for about 22 months on account of orders of the Honourable Supreme Court of Pakistan to maintain status quo. Further, it took additional time to mitigate the after-effects of the litigation and bring the Project back on track as most of the activities had to be started afresh.

2.4 The Project envisages development, design, engineering, financing, construction, testing & commissioning, owning, operation, maintenance and transfer (on completion of the PA term) of an approximately 840 MW Run-of-the-River Hydropower plant on Kunhar River, Kaghan Valley in the Mansehra District of the Khyber Pakhtunkhwa Province of Pakistan on Build, Own, Operate and Transfer (BOOT) basis in accordance with GOP's Policy for Power Generation Projects 2002.

2.5 In the EPC international competitive bidding process, the bidders were required to carry out their own study of the project parameters. Based on its own study and assessment, the successful bidder/EPC contractor has, inter-alia, guaranteed that the net plant output/contract capacity shall be

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861,000 kW and the average net energy generation shall be 3048.0 GWh. The EPC stage tariff petition is, therefore, based on the plant parameters guaranteed by the successful bidder/EPC contractor.

2.6 The Petitioner submitted that it appointed the Joint Venture of National Engineering Services Pakistan (Pvt) Ltd (NESPAK) and Integrated Consulting Services (Pvt) Limited (ICS); jointly known as NESPAK—ICS Joint Venture in association with Tractebel Engineering S.A. -Coyne et Bellier of France as consultants for review of Feasibility Study, preparation of EPC Bidding Documents for the Project and provide assistance in the bidding process.

2.7 As per the Petitioner three bidders submitted their bids which were evaluated by the Petitioner's in-house experts. After thorough due diligence and negotiations, the lowest bidder i.e. China Gezhouba Group Company Ltd., China was selected as EPC Contractor. The Petitioner further submitted that based on agreed EPC price with the aforementioned EPC contractor, it has signed Preliminary Agreement whereby the EPC price has been fixed subject to adjustment in respect of the following costs.

(i) Variation in Custom Duties beyond the current rate of 5%;
(ii) Additional Work on Day-Work basis to cover up unforeseen items;
(iii) Escalation of cost of civil works during execution; and
(iv) Variation in classification of rock in tunnels as encountered during construction of tunnels based on the actual length of each class of rock but the total length as envisaged at the time of signing of the Preliminary Agreement shall remain fixed.
(v) Withholding tax @ 6% of the cost of local supplies/construction services under the Construction Contract is deductible from Contractors'/Sub-contractors' payment invoices.

2.8 The Petitioner has provided the following breakup of the project costs and assumptions for the aforementioned requested tariff.

Sr. No.	Item Description	Estimated Cost (Million US$)
	EPC Cost	
1.	EPC Cost excluding Custom duties	1301.50
2.	Custom Duties	13.147
	Total EPC Cost:	**1314.297**
	Non – EPC Costs	
5.	Project Management Cost @ 7.5% of EPC Cost	98.572
6.	Investigations, Feasibility Study, Misc. Expenses, etc.	20.214
7.	Additional Investigations, Review of Feasibility Study, Preparation of EPC Documents, etc.	15.160
8.	Engineering & Construction Supervision @ 5% of EPC Cost	65.715
9.	Law Services Cost	13.143
10.	Land & Resettlement Cost	6.900
11.	Environmental & Ecology Cost	9.247
12.	Equity Arrangement Fee @ 2% of 49% of Total Equity	4.793
13.	Overseas Investment Insurance during	13.206

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	construction – on 30% Equity (Chinese Investment) @ 1.5% a	
	Sub – Total:	**246.950**
	Total Capital Cost:	**1561.247**
	Financing Cost	
14.	Overseas Investment Insurance during Construction – On Debt	95.919
15.	Debt Management Fee	22.010
16.	Legal Charges	3.668
17.	Commitment Fee	36.059
18.	Interest During Construction	237.519
	Sub – Total :	**395.175**
	Total EPC Stage Project Cost: **Specified Project Cost per MW Installed:**	**1956.422** **2.248**
19	**Operational Costs**	
	Fixed O&M cost per annum	**US$ 22.0 Mln (45% Foreign & 55% Local component**
20	**Variable O&M cost per annum**	**US$ 5.5 Mln (20% Foreign & 80% Local component)**
21	**Insurance expense per annum**	**1.35% of EPC cost**
22	**Water Use Charge**	**Rs. 0.15/kWh**
23	**Debt : Equity**	**75 : 25**
24	**Return on Equity**	**17% (IRR based)**
25	**PPA Term**	**30 years**

2.9 On the basis of project cost and other main assumptions, SKHPL has worked out a yearly tariff as well as levelized tariff of Rs. 11.3068/kWh (US cents 11.6086/kWh) for 30 years of proposed term of agreement with NTDC/CPPA for approval of the Authority.

3. Considering the submissions of the Petitioner, comments received from stakeholders, information available on record and proceedings of the case, the Authority framed the following issues for discussion and determination.

i) Whether the proposed capacity and annual energy production of power plant is justified?
ii) Whether the claimed EPC cost is justified?
iii) Whether the claimed other project costs are justified?
iv) Whether the claimed annual project operational cost is justified?
v) Whether the claimed Tariff is justified?

4. The issue wise discussion, analysis and determination of the authority is as under.

5. **<u>Whether the proposed capacity and annual energy production of power plant is justified?</u>**

5.1 The Petitioner has submitted the following information in respect of plant capacity and annual energy production.

Estimated Installed Capacity	870.250 MW
Auxiliary consumption	9.250 MW (1.06%)
Net Plant Capacity	861.000 MW
Annual Gross Generation	3081.25 GWh
Auxiliary Consumption	33.25 GWh (1.06%)
Net average annual Energy	3048.00 GWh
Average Annual Plant Capacity Factor	40.412%
Type of Turbines	Pelton
No. of Units	4

5.2 The Authority in its earlier determination dated November 18, 2008 for the same project at feasibility stage had approved gross capacity of 840 MW, net capacity of 831.600 MW after auxiliary consumption of 1.00% and the net annual energy of 2928.519 GWh for the project. The petitioner in its instant submission at the EPC stage has increased plant capacity to 870.25 MW and net annual energy from 2928.519 GWh to 3048.00 GWh with no appreciable increase in the net annual plant capacity factor of 40.41%.

5.3 In the hearing of the petition the Authority inquired about the low annual plant capacity factor (i.e. 40.4%) and asked the petitioner whether it has optimized the now proposed installed capacity of 870.25 MW based on incremental cost of additional capacity. The petitioner in response to above queries of the Authority vide letter dated September 14, 2013 submitted detailed explanation in respect of optimization of installed capacity and energy optimization. The Petitioner also made reference to relevant paras of Project Feasibility wherein the Project Consultants had carried out optimization study of project capacity on marginal cost basis while taking in to account available hydrology, different sizes of tunnel diameter ranging from 5 m to 8 m and associated additional costs, whereas the energy was computed through P&E model under various options. The Petitioner explained that based on studies carried out under different options the marginal cost in respect of the proposed project size was minimum and therefore was selected for the proposed project site. With regard to increased project size from 840 MW as per the approved feasibility to now proposed installed capacity of 870.25 MW the Petitioner submitted that the prospective bidders, during EPC international competitive bidding process, were required to carry out their own study of the project parameters. Based on study and assessment, the successful bidder/EPC Contractor has guaranteed the net plant output/contract capacity of 861.000 MW.

5.4 The Authority has reviewed the EPC Contract Agreement and other information made available to it and found to be in agreement with submissions of the Petitioner. The Authority considers that the net capacity of 861.00 MW has been guaranteed by the EPC contractor which the EPC contractor will demonstrate at the time of performing commissioning tests under the standardized Power Purchase Agreements. The Authority therefore has decided to allow net installed/contracted capacity of 861.0 MW subject to the condition if the same is found to be higher than 861.0 MW pursuant to commissioning tests, the benefit of such additional capacity will be passed on to the consumers through necessary adjustment in tariff at COD.

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Auxiliary Consumption and net annual energy

5.5 The Petitioner has proposed auxiliary consumption of 33.250 GWh which is 1.0796% of gross annual energy of 3081.25 GWh. The Authority in other comparable cases has approved auxiliary consumption at 1.0% of the gross energy. Further technical analysis conducted by the Authority also suggests 1.0% auxiliary consumption for Suki Kinari hydropower project. The Authority has therefore decided to allow auxiliary consumption at 1.0% of the Petitioner's proposed gross annual energy production of 3081.25 GWh. Accordingly the net annual energy while taking in to account 1.0% auxiliary consumption works out to be 3050.438 GWh and is approved for the project.

6. **Whether the claimed EPC cost is justified?**

6.1 The petitioner has claimed US$ 1314.297 million (US$ 1.510 million/MW) as EPC cost. The Petitioner has submitted that the above EPC contract price has been finalized based on EPC bidding carried out by the company. The Petitioner in its submissions has mentioned the whole process of EPC bidding and has also provided necessary documentation in the matter.

6.2 According to the information provided by the Petitioner sixteen prospective bidders showed their interest in the project and purchased bidding documents. However only three submitted their bids which were accepted and evaluated by the in-house experts of the Petitioner. The ranking of three qualified bidders along with quoted EPC price is given hereunder.

Name of Bidder	**Total Bid Price (US$ Million)**	**Ranking**
China Gezhouba Group Company (CGGC)	1337.652	1st Lowest
Sinohydro	1338.470	2nd. Lowest
Farab International	1449.223	3rd Lowest

6.3 After some adjustment in the figures of custom duty and local and foreign currency components the final EPC bid price of CGGC as agreed at US$ 1314.297 million was accepted and CGGC was selected as the EPC Contractor.

6.4 According to the Petitioner it has signed a Preliminary Agreement with China Gezhouba International Engineering Co for Equipment Supply Contract and China Gezhouba Group Company Ltd for Construction Contract affirming commitment for execution and completion of the Project on EPC basis and agreeing on the main terms. The preliminary agreement with both companies was signed on June 21, 2013.

6.5 The following breakup of the EPC cost in the local and foreign components has been provided by the Petitioner.

EPC Cost	**Local (Rupees Million)**	**Foreign (US$ Million)**
Equipment Supply Contract		287.752
Construction Contract	38,903.050	627.130
Total	38,903.050	914.882
Total in US$	**1314.297 million**	

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6.6 According to the terms of EPC Contract/Agreement, the above contract price is adjustable for the following.

Custom Duties: Custom duty at 5% on the import of plant and equipment not manufactured locally amounting to Rs. 1280.473 million (US$ 13.147 million) is included in the above contract price, which shall be adjusted as per actual at maximum of 5% of the amount of imported plant and equipment at COD. However, in case of change in 5% rate the amount of custom duty shall be accordingly adjusted in the EPC contract price.

Adjustment for additional work on Day-Work Basis: The Contract price under Construction Contract (CC) includes an amount of Rs. 88.509 million as a "Daywork Provisional" item to cater for the cost of additional work done on Day-Work basis, which may be essentially required to cater for the incidental/unforeseen works not covered in the scope of work specified under the CC. The additional work on Day-Work basis shall only be undertaken upon prior authorization by the Employer (Petitioner) in accordance with the provisions of the CC.

6.7 Review of the contract documents and other relevant information provided along with the petition reveal the following breakup of EPC cost.

EPC Cost	Local (Rs. Mln)	Foreign (US$ Mln)	Total (US$ Mln)	US$ M/MW
Civil Works other than Tunnels	8596.646	206.450	294.711	0.3387
Tunnels	15380.822	368.466	526.380	0.6049
E&M Works	3102.044	281.978	313.827	0.3606
Testing and Commissioning	4.826	0.446	0.495	0.0006
Detailed Engineering	1311.394	31.416	44.880	0.0516
Coordination, Inland Transport & Services	4043.541	18.506	60.020	0.0690
Other EPC Costs	344.796	7.620	11.160	0.0128
Provisional Sums	4838.509	0.000	49.677	0.0571
EPC Cost without Custom Duty	37622.577	914.882	1301.150	1.4951
5% Custom Duty on Imported plant	1280.473	0.000	13.147	0.0151
Total EPC Cost	38903.050	914.882	1314.297	1.5102

6.8 While reviewing the EPC cost, the Authority has observed that the cost of main components of the overall EPC cost is within the acceptable band on comparable basis. The Authority also noted that civil works cost in the instant case is slightly higher i.e US$ 0.9436 million/MW in comparison to civil works cost of a conventional hydropower plant which ranges between 0.500 million/MW to 0.700 million/MW. The obvious reason for the higher civil works cost of the Petitioner is on account of its requirement for construction of long head race tunnels (about 19.4 km). However when compared this cost on per MW basis with another project of similar nature involving long head race tunnels is reasonable and therefore justified. The Authority is convinced that the overall EPC cost of 1314.297 million (US$ 1.510 million/MW) as claimed by the Petitioner has been arrived at through due process of competitive bidding and is also comparable on per MW basis rather it turns out to be appreciably lower than the already approved EPC cost/MW of other hydropower projects at the EPC stage. The Authority therefore finds it justified and approves the EPC cost of US$ 1314.297 million based on EPC contract signed between the EPC Contractor and the Petitioner.

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Adjustment of EPC Cost

6.9 The Petitioner has requested for adjustment of EPC cost as per the terms of EPC Contract. The Authority allows adjustment of EPC Cost on the basis of actual based on verifiable documentary evidence at COD. In addition to normal adjustment of foreign component of the EPC Cost due to variation in the applicable exchange rate over the reference exchange rate of Rs. 97.40 to a US Dollar, the adjustment in respect of the following components of EPC cost shall be allowed at the time of COD.

Custom Duty

6.10 The total EPC Cost of US$ 1314.297 million as per the provisions of EPC Contract is inclusive of Custom Duty estimated at US$ 13.147 million. In this regard the Para 4.2.1 of the EPC Agreement, inter alia provides as mentioned hereunder.

> "The Employer confirms that the custom duty at the rate of 5% is payable on the import of plant and equipment not manufactured locally. The Contract Price under CC (Construction Contract) includes an amount of Pak Rs.1,280,473,268 for payment of custom duties on the imported plant and equipment, metal works and construction materials not manufactured locally in Pakistan. This shall be adjustable at actual on production of documentary evidence up to the maximum of the aforesaid amount at the rate of 5% custom duty. If the rate of custom duties is increased/decreased from the current rate of 5% on the import of plant and equipment not manufactured locally, this increase/decrease shall be adjusted in the Contract Price of CC. Custom duties and other surcharges on import of any plant and equipment, metal works and construction materials manufactured in Pakistan and meet the Project Requirements shall not be adjusted and instead shall be paid by the Contractor".

6.11 The custom duty is pass through cost as per provisions of the GOP Power Generation Policy for IPPs 2002. The Authority has already allowed the cost of custom duty as pass through item in the case of other IPPs. The Petitioner is therefore allowed adjustment of Custom Duty on actual basis at COD subject to provision of verifiable documentary evidence to be provided by the Petitioner.

Adjustment of Provisional Sums

6.12 The total EPC cost of the Petitioner includes an amount of Rs. 4838.509 million as Provisional Sum to cater for specified and unspecified works to be under taken during the project construction period. According to the terms of EPC Agreement Rs. 88.509 million has been provided to cater for cost of additional work done on Day-Work basis, which may be essentially required to cater for the incidental/unforeseen works not covered in the scope of work specified under the Construction Contract (CC). The Authority has examined the applicable conditions of the EPC Agreement and decided to allow Rs. 4750 million on account of cost of specified items, however, the cost of additional work on Day-Work basis (Unspecified works) will be adjusted on the basis of actual at COD subject to the maximum amount of Rs. 88.509 million on the basis of verifiable documentary evidence to be provided by the Petitioner.

Civil Works cost adjustment/Indexation

6.13 The Petitioner has requested for adjustment of Civil Works cost escalation in accordance with the terms settled with the EPC Contractor. According to the adjustment mechanism stipulated in the

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preliminary EPC Agreement and also mentioned in the tariff petition, the cost of civil works shall be adjusted on account of variation in the reference price of construction material such as labor, cement, steel and fuel, based on monthly prices published by the Pakistan Institute of Cost and Contracts (PICC). Further the cost of tunnels will also be adjusted on account of actual variation in rock type encountered during project construction over the assumed rock type taken as reference at this stage. However no adjustment on account of variation in the total length (quantities) shall be allowed.

6.14 For the purpose of civil works cost escalation the petitioner has provided the following rates of construction material used as reference in the EPC Cost based on PICC published rates for December 24, 2012.

Item	Base or Reference Rate	Basis
Labor	Rs. 680/day	Minimum wages for Foreman as published by PICC, Mansehra.
Fuel	Rs. 109.8083/litre	Average of price of one litre of petrol plus five litres of HSD as published by PICC, Mansehra.
Cement	Rs. 9000/ton	Price of Cement as published by PICC, Mansehra.
Reinforced Steel	Rs. 84455.2733/ton	Average of price oof two tons of Mild Steel rebar 1/2 inch dia(deformed) Grade 60 plus one ton of Mild Steel rebar 1/2 inch dia (deformed) Grade 40 as published by PICC, Mansehra.

6.15 According to the adjustment mechanism proposed by the petitioner the 60% of the total cost of civil works both in local currency and foreign (US$) amounting to US$ 821.090 million is fixed whereas 40% of total civil works cost is adjustable on account of variation in the future monthly published prices of aforementioned materials by PICC over the reference price of labor, cement, steel and fuel based on percentage composition of each material cost in the overall civil works cost as per the following table.

Item	Composition
Fixed Portion	60%
Adjustable portion	
Labor	7%
Fuel	20%
Cement	5%
Reinforced Steel	8%

6.16 The Authority has examined the Civil works cost adjustment mechanism as proposed by the Petitioner and found to be slightly different in its application from that already approved by the Authority in the case of other EPC stage hydropower projects. The information provided by the Petitioner revealed that the EPC bidding documents on the basis of which EPC bidding was carried out by the Petitioner contained the same aforementioned civil works cost adjustment mechanism as proposed by the Petitioner.

6.17 The Authority considers that the proposed civil works cost adjustment mechanism on the basis of percentage composition of each material as well as indexation/escalation based on PICC published rates, has been agreed in the EPC Agreement signed between the Petitioner and the EPC Contractor,

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therefore any change in the adjustment mechanism at this stage will be in disagreement with the terms of EPC Contract and may hamper the progress of the project which will not be in the interest of the project as well as the consumers. The Authority therefore, has decided in principle, to accept the proposed mechanism.

6.18 The Authority however does not agree with the Petitioner request for adjustment of total civil works cost including the foreign component. The Authority considers that the GOP Policy for Power Generation Projects 2002 as well as the Hydropower Mechanism already approved by it allow adjustment/escalation of civil works construction materials such as Labor, Cement, Steel and Fuel due to variation in their prices during the project construction period for the local component of civil works cost and local price indices and therefore can not be applied to foreign component of civil works cost. Further it has also been confirmed from Bidding Document Volume 1-Invitation to Bidders page 3-226 that adjustment of civil works cost is applicable to the local component of Civil Works cost. The Authority, therefore has decided to allow adjustment/cost escalation of aforementioned materials based on local component of all civil works including tunnels.

6.19 Accordingly, the adjustment of civil works cost on account of variation in four items of civil construction material (steel, cement, labor and fuel) will be applicable to the local component of civil works cost of Rs. 23,977.467 million. Out of this total amount Rs. 14,386.480 million will be fixed whereas Rs. 9590.987 million is adjustable on account of variation in price of aforementioned materials based on their individual percentage composition as per the following formula.

$$Pn = 0.60 + 0.07*(Ln/Lo) + 0.20*(Fn/Fo) + 0.05*(Cn/Co) + 0.08*(Sn/So)$$

Where;

"Pn" is the adjustment factor to be applied to the estimated value of the work carried out in Month "n".
"Lo", "Fo", "Co" and "So" are the base cost indices or reference prices of Labour, Fuel, Cement and Steel as given in the above table; and
"Ln", "Fn", "Cn" and "Sn" are the cost indices or prices corresponding to the above cost elements in the Month "n".

7. **Whether the claimed other project costs are justified?**

7.1 The Petitioner has claimed US$ 642.125 million on account of other project projects not included in the EPC contract under various heads which are discussed hereunder.

7.2 Land Resettlement and Acquisition cost

7.2.1 The petitioner has claimed US$ 6.900 million for procurement of land and resettlement cost. The Authority has allowed the same cost of land and resettlement in the feasibility stage tariff of Suki Kinari. The cost of land and resettlement is adjustable as per the Hydropower Mechanism approved by the Authority on actual at COD based on verifiable documentary evidence to be provided by the petitioner. In view hereof, the requested cost of US$ 6.900 million is allowed by the Authority at this stage subject to adjustment on the basis of actual upon submission of verifiable documentary evidence at COD.

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7.3 Environment and Ecology

7.3.1 The petitioner has claimed US$ 9.247 million on account of cost of mitigating adverse effects on environment and ecology due to construction of hydropower project. The Petitioner has been allowed the same amount under this cost head at the feasibility stage tariff determination of the Authority. According to the Petitioner, the project sponsors are required to fulfill their obligations under the Environmental Protection Act 1997, for which it has initially estimated an amount of US$ 9.247 million that may increase later on upon completion of the project. It has been further submitted that in case of increase in the estimated amount ,the same will be adjusted on actual basis at the time of COD. In support of its claim the Petitioner has provided a copy of the approval of the Environment Protection Agency Government of Khyber Pakhtunkhwa whereby the project is required to meet, inter alia, the following conditions and associated costs.

- Damage to forest should be assessed and mitigation/compensation plan be finalized with the Forest Department prior to construction. To minimize erosion, afforestation program in consultation with forest department should be planned and implemented in the catchment area of the proposed Dam.
- At least one Hatchery should be constructed for trout fish in the area in consultation with the fishery department or fish ladder may be provided for movement of fish for up or down stream.
- Present right of way of irrigation should be protected.
- The proponent should ensure to avoid dumping of debris in to down slope. A prior area should be identified for disposal of debris and be stabilized by proper plantation, bio-engineering and engineering techniques.
- Alternate road should be constructed before damaging the existing road which will be submerged due to this project.
- The proponent will adopt all precautionary and mitigation measures identified in EIA Report and any un anticipated impacts during the construction and operation phase of the project. The mitigation measures proposed in the EIA report are considered as 'commitments' and institutional arrangements for its implementation and will be finalized before the start of construction so that proposed mechanism of environment protection should work in time.

7.3.2 In order for the Petitioner to fulfill its obligations for mitigating adverse effects of environment and ecology at the project site and catchment area spread over 1306 km^2, the estimated amount of US$ 9.247 million as proposed by the Petitioner and already allowed by the Authority in the feasibility stage tariff determination is approved by the Authority subject to adjustment on the basis of actual upto a maximum of US$ 9.247 million on provision of verifiable documentary evidence by the Petitioner at COD.

7.4 Project Supervision/Owner's Engineer cost

7.4.1 The Petitioner has claimed US$ 65.715 million (5% of the EPC cost) for the cost of Owner's engineer. As per the information provided by the petitioner, this cost component includes cost of engineering consultants for overall supervision of works performed by the EPC contractor during the project construction period.

7.4.2 The Authority considers that cost of US$ 65.715 million on account of Owner's Engineer cost to cater for project supervision by a consulting firm on behalf of the Petitioner during the project

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construction period is excessively on the higher side. The Authority has observed that the Petitioner has claimed this cost on estimated basis without any documentary evidence to substantiate its claimed cost. The Power Purchase in its comments to the Authority has also objected on high cost of Owner's Engineer claimed by the Petitioner.

7.4.3 The Petitioner's claimed cost of Owner's Engineer has been compared with the Authority allowed cost for the same component to other hydropower projects at the EPC stage and it has been found that Petitioner's claimed cost of US$ 65.715 million does not fall within the acceptable band in terms of all comparable project parameters i.e. considering the project size, construction period as well as on percentage of EPC cost basis.

7.4.4 In view of the above the Authority has assessed US$ 33.383 million for the cost of Owner's Engineer on the basis of 2.54% of the EPC Cost based on its latest decision in the case of EPC stage tariff approval of hydropower project and therefore is allowed to the Petitioner.

7.5 Owner's Advisors/Consultants Cost

7.5.1 The Petitioner has claimed US$ 48.517 million on account of cost of owner's technical, financial, insurance, tax and legal advisors and consultants. The Petitioner has claimed the aforementioned cost under separate heads. Generally, such cost in other hydropower projects is claimed under the cost heads of Project development cost and Owner's Engineer cost. The Petitioner's claimed cost of US$ 48.517 million has been discussed separately under each sub-head as hereunder.

Law Services Cost

7.5.2 The Petitioner has claimed US$ 13.143 million on account of services of the legal advisor. The Authority at the feasibility stage tariff determination has allowed US$ 7.771 million for this cost component. The Petitioner has not provided any documentary evidence to substantiate its claim. In view hereof the Authority has decided to allow US$ 7.771 million as already allowed to the Petitioner in the feasibility stage tariff determination of the Authority.

Investigations, Feasibility study, additional investigation, preparation of bidding documents.

7.5.3 The Petitioner has claimed US$ 20.214 million on account of cost incurred for preliminary project technical and environmental investigations, preparation of project feasibility study and other related miscellaneous expenses. The Petitioner has further claimed an amount of US$ 15.160 million on account of cost for carrying out additional investigations, Review of Feasibility study and preparation of EPC bidding documents.

7.5.4 The Authority has considered the cost claimed by the Petitioner under the above mentioned heads and finds to be on the higher side. The Power Purchaser in its comments to the Authority objected that the cost claimed by the Petitioner under these heads is quite on the higher side. The Power Purchaser has also referred to cost of feasibility study of large size hydropower project and suggested that the Petitioner may be allowed the cost of feasibility studies on comparable basis. In the Authority's opinion, the cost for conducting feasibility study of hydropower project varies widely on account of project specific requirements involving hydrological studies, environmental impacts and extent of investigations, geology and design of the plant. Suki Kinari hydropower project is located in the seismic zone and is rather complex from the design point of view involving long head race tunnels, reservoir and other civil structures.

7.5.5 As per information provided by the Petitioner, the feasibility study of the project has been conducted by the foreign consultants i.e. Mott MacDonald UK who started their work on May 2, 2006 and completed feasibility study for approval by the Panel of Experts of PPIB on April 15, 2008. The information provided by the Petitioner further revealed that in order to carry out a competitive bidding process and to prepare detailed bidding documents, it appointed a joint venture of NESPAK, Integrated Consulting Services (Pvt) Ltd in association with Tractebel Engineering S.A. According to the petitioner the Consultants also carried out review of the feasibility report in order to further elaborate the technical aspects of the project in the bidding documents.

7.5.6 While considering all relevant aspects, information provided by the Petitioner, comments of the Power Purchaser and cost allowed under this head to other comparable hydropower projects, the Authority has assessed lump sum amount of US$ 10.000 million for the cost under the above head to be reasonable and is being allowed to the Petitioner.

7.6 Project Development/Management cost

7.6.1 The Petitioner has requested for approval of US$ 98.572 million on account of project development/management expenses. According to the information provided by the Petitioner cost component includes project development and management costs from inception of the project till COD as well as all pre-COD expenses of the Petitioner during the project construction period. The Petitioner has further submitted that in spite of stretching the development period for at least 22 months because of litigation as discussed in the petition, this cost is lower than recently allowed by NEPRA to a comparable rather a less complex hydropower project.

7.6.2 The issue of high project development/management cost was discussed in the hearing. The power purchaser (CPPA/NTDC) in its comments has also objected to high cost as claimed by the petitioner. The detailed breakup of project development cost provided by the Petitioner revealed that an amount of US$ 42.550 million on account of Insurance during construction has been included in the project development/management cost. The Authority has allowed the cost of Insurance during construction phase separately, therefore the Project Development/Management cost excluding Insurance during construction works out to be US$ 56.022 million.

7.6.3 The Petitioner's requested cost of US$ 56.022 million under the above mentioned head is still considered to be on the higher side on comparable basis with other hydropower projects. The Petitioner has not provided any documentary evidence in support of its aforementioned claim, rather this cost has been claimed on estimated basis. The scrutiny of detailed cost breakup of project development/management expenses provided by the Petitioner revealed that cost of certain items for the project development as well as project construction period as estimated by the Petitioner was quite on the higher side. After making necessary adjustments in costs claimed under project development period and the Petitioner's overheads during project construction period, an amount of US$ 37.437 million has been assessed for the project development/management cost and is therefore approved by the Authority.

7.7 Insurance During Construction

7.7.1 The Petitioner in the Petition had clubbed the cost of insurance during construction in the overall cost of Project development/management cost of US$ 98.572 million. The Petitioner was asked to submit the detailed breakup of the project development/management cost. As per the information provided by the Petitioner, an amount of US$ 42.550 million (3.24% of EPC cost) has been claimed for its Insurance during construction component. As per the EPC Contract Bidding Documents Volume 2 ,

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the Petitioner is required to obtain insurance to cover any loss in respect of Marine and Air Cargo for all materials, equipment, machinery, spares and other items for incorporation in the complex, Loss of revenue to cover, against loss of revenue following delay in start of commercial operation as a direct result of physical loss or damage to the materials, equipment, machinery and other items in transit and the cover for Contract works executed by the contractor and also cover for any loss or injury or damage of property arising out of the construction, testing and commissioning of the project.

7.7.2 The Authority in the case of other comparable hydropower project at feasibility stage has allowed insurance cost at 2.40% adjustable on actual basis upto a maximum of 2.75% at COD. In the case of a hydropower project at EPC stage, the Authority has allowed the cost of Insurance at 2.50% adjustable up to 2.75% on actual basis. The Authority has however, observed that construction period in the case of Suki Kinari hydropower project is 72 months (6 Years) as compared to other comparable projects where the project construction period was in the range of 48 months to 51 months. In view of the aforementioned, the Authority considers that Insurance during construction for the Petitioner at 2.75% of the EPC cost (i.e. US$ 36.143 million) will be sufficient to meet insurance expenses. The Authority has therefore decided to allow insurance during construction at 2.75% of the approved EPC cost subject to adjustment on the basis of actual up to a maximum of 2.75% of the EPC cost, to be allowed at COD on production of verifiable documentary by the Petitioner.

7.8 Equity Arrangement Fee

7.8.1 The Petitioner has claimed equity arrangement fee of US$ 4.793 million based at 2% of 49% of total equity. The financing structure as proposed by the Petitioner shows that 25% of the total project will arranged by the project sponsors. According to the information provided by the Petitioner , it has not finalized the amount of financing to be contributed by its proposed investors neither any documentary evidence to this fact has been provided by the Petitioner.

7.8.2 The Authority has observed that Petitioner had raised the same demand in its feasibility stage tariff petition and the Authority did not consider this demand of the petitioner due to the reason that it is responsibility of the project sponsors under the GOP Policy for Power Generation 2002, to arrange and demonstrate the required equity for the project to achieve financial close. The Authority therefore considers that the Petitioner's request for allowing US$ 4.793 million on account of equity arrangement fee is not justified, hence not allowed by the Authority.

7.9 Overseas Investment (Sinosure) Insurance during Construction on Equity

7.9.1 The Petitioner has claimed US$ 13.206 million on account of Sinosure Insurance on equity based on 1.5% per annum on 30% Equity (Chinese Investment). According to the petitioner the terms of Sinosure Insurance have been proposed as indicated by the Chinese lenders and will be finalized at the time of signing of term sheet with the lenders.

7.9.2 The Authority in the case of another hydropower project which is also to be financed by the Chinese investors has not allowed Sinosure Insurance on Equity part of project financing in its feasibility stage tariff determination for the project based on the rationale that project sponsors of hydropower projects are allowed 17% IRR based return for whole life of the project due to higher inherent risks of hydropower projects development. In line with its earlier decision for another project, the Authority has decided not to allow US$ 13.206 million on account of Overseas Investment (Sinosure) insurance on equity part during the project construction period.

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7.10 Overseas (Sinsosure) Insurance on Debt

7.10.1 The Petitioner has claimed US$ 95.919 million for Overseas Investment (Sinosure) Insurance during Construction on Debt part of project financing. According to the information provided by the Petitioner, 75% of the total project cost will be financed as debt from Chinese banks. The Petitioner through its subsequent submissions has indicated that Industrial and Commercial Bank of China (ICBC) has shown its interest for financing of the project subject to provision of Sinosure coverage on the insured assets. The Petitioner has not provided the basis or calculations of the requested amount. The petitioner through its subsequent reply to the queries on various cost items has indicated that it has made efforts with lenders to reduce the spread over 6-month LIBOR to 400 basis points. The petitioner has submitted that the lenders have agreed to reduce spread to 450 basis points subject to the condition that an upfront overseas investment insurance (Sinosure) is allowed at the rate of 8% of the project cost.

7.10.2 The Authority has considered the Petitioner's request and observed that the terms of financing as well as the issue of Overseas investment insurance (Sinosure) have not been finalized as yet by the Petitioner with its Chinese lenders. The Authority considers that the issue of Sinosure on debt appears to be premature in the instant case as the Petitioner is not sure of the basis and terms on which Sinosure insurance will be finally agreed in the financing documents. The Authority further considers that the condition of Sinosure Insurance on financing from Chinese banks needs to taken up by the GOP with Chinese Government for its waiver so that consumers of electricity are not burdened with this additional cost. The Petitioner has also shown its determination for further negotiations for waiver of the condition of Sinosure Fee for the project or to bring it down to the bare minimum, the least, before finalizing financing documents with its proposed lenders.

7.10.3 The Authority, however, is cognizant of the fact that it has already allowed Sinosure fee to other power projects to be financed from Chinese banks and therefore, its straight away rejection in the instant case may hamper progress of the project. In view hereof the Authority has decided to alllow Sinosure on debt on provisional basis. Accordingly a provisional lump sum amount of US$ 94.585 million, which is equivalent to 7.0% of the total assessed amount of loan, is being allowed at this stage subject to adjustment at COD on the basis of actual with maximum ceiling of 7% of the total loan amount. The Petitioner is directed to extensively negotiate the condition of Sinosure insurance on debt with the proposed lenders before signing financing documents. The Authority has further decided not to include the provisional amount of US$ 94.585 million in the approved project cost as well as tariff at this stage, as the approved tariff of the Petitioner will be unnecessarily inflated in case application of Sinosure on debt is later on avoided by the Petitioner through successful negotiations with its lenders.

7.11 Financial Charges

7.11.1 The Petitioner has claimed US$ 61.737 million on account of Financing cost (Financial Charges) on foreign debt to be procured for the project. The following breakup of financial charges has been provided by the petitioner.

Financial Charges	**US$ Million**
Debt Management Fee	22.010
Legal Charges	3.668
Commitment Fee	36.059
Total	**61.737**

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7.11.2 The Authority in the case of other IPPs has established a benchmark for financial charges of 3% of the total debt amount excluding the impact of IDC. The Petitioner has submitted that due to long gestation period of the project i.e. 72 months the cost of financial charges in its case will be more than the 3% benchmark already established by the Authority for other projects. The Petitioner has claimed this cost on the basis of estimates as the terms of financing with the lenders are still to be finalized. The Authority therefore does not find any justification for increased amount of financial charge than its already set benchmark of 3% in other similar hydropower projects. Accordingly US$ 43.655 million based on 3% of the loan amount excluding the impact of Interest during construction (IDC) and financial charges is approved by the Authority subject to adjustment on actual basis with maximum ceiling of 3% of the loan amount (excluding the impact of IDC and financial charges) based on verifiable documentary evidence at the time of COD.

7.12 Terms of Debt and Interest During Construction (IDC)

7.12.1 The Petitioner has submitted that 75% of the total project cost will be financed from foreign debt. The petitioner has indicated that debt will be procured from Chinese banks (ICBC) at terms to be settled with lenders before the financial close of the project. The tenure of debt has been proposed as 12 years with 72 months grace period. The payment of debt along with interest will be made bi-annually. On the basis of aforementioned terms of debt the petitioner has claimed US$ 237.519 million on account of IDC based on 72 months project construction period ,the proposed debt drawdown and 100% foreign financing based on 6-month LIBOR at 0.41326% plus 475 basis points. The Petitioner has submitted that actual amount of IDC will be adjusted at COD on the basis of final terms agreed with the Chinese lenders.

7.12.2 The Authority has considered the Petitioner request and the proposed terms of financing and finds these to be in agreement in general with decision of the Authority in other cases. The Authority however does not agree to the proposed spread (premium) of 475 basis points over LIBOR as proposed by the Petitioner. In the opinion of the Authority, there is a sufficient room for the project sponsors to finalize the spread over LIBOR at better terms through further negotiations with the lenders. The Authority has therefore decided to allow 450 basis points over LIBOR to the Petitioner at this stage with directions for further possible reduction in the interest of consumers. In case, spread over LIBOR is finalized at lower than 450 basis points, the benefit of such spread at a lower rate will be shared between the Petitioner and the power purchaser/consumer in a ratio of 60:40 respectively in accordance with the provisions of GOP Policy for Power Generation Projects 2002.

7.12.3 The amount of IDC is adjustable on the basis of actual drawdown and variation in LIBOR over the project construction period. On the basis of approved spread of 450 basis points, 6-month LIBOR at 0.41326% and the petitioner's proposed drawdown of loan during the project construction period of 72 months the amount of IDC has been calculated as US$ 208.203 million and is therefore allowed at this stage subject to adjustment at COD based on actual drawdown of loan and variation in LIBOR during the project construction period.

8. **Whether the claimed annual project operational cost is justified?**

8.1 The operating cost of the project during the project operational period of 30 years based on submissions of the petitioner are discussed hereunder.

8.2 O&M Cost

8.2.1 The Petitioner has submitted that in the Feasibility Stage Tariff Determination, NEPRA allowed total O&M cost at 1.5% of the project cost. The Operation and Maintenance costs depend on a variety

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of factors which include design and complexity of the facility, site specific hydrology, environmental characteristics, remoteness of the site etc. The presence of quartz in the Kunhar river water is another serious matter which will entail additional maintenance requirements/costs. The cost of the required monitoring, maintenance and repairs need to be assessed based on all these factors. After careful consideration based on the local conditions and the candid opinion of the experts in the industry, SKHPL has estimated that average annual O&M expenses will be US$ 27.5 million to ensure prudent operation and maintenance of the hydropower project covering all civil, mechanical and electrical installations for the initial PPA term of thirty (30) Agreement years. This is around 1.4% of the project cost which is lesser than that allowed by NEPRA to other less complex IPP hydropower projects.

8.2.2 The Petitioner has further proposed that Fixed O&M cost shall be 80% of the total O&M cost i.e. US$ 22.0 million while the Variable O&M cost shall be 20% of the total O&M cost. i.e. US$ 5.5 million. As per the Petitioner 45% of the expenses against Fixed O&M cost shall be incurred in foreign currency and rest shall be in local currency whereas 20% of the total Variable O&M cost will be in foreign currency while 80% will be in local currency.

8.2.3 In the Authority's opinion, the per annum expense on account of operation and maintenance of a hydropower project, besides routine maintenance of plant and equipment, is also dependent on the project specific requirements such as environmental protection of project area and maintenance of all civil structures. Suki Kinari hydropower project requires 54.5 m high dam/reservoir and about 19.5 km headrace tunnel. Accordingly the annual O&M cost in the case of Suki Kinari hydropower project may be more than other conventional hydropower projects where there is no requirement of underground tunnels for such large size and length as of Suki Kinari. The Authority in the feasibility stage tariff determination of Suki Kinari has allowed US$ 16.2104 million based at 1.5% of the approved project cost. The Petitioner has not provided any documentary evidence or O&M contract to substantiate its O&M cost. The O&M cost has been claimed on the basis of fair estimates by experts in the field as already mentioned by the petitioner.

8.2.4 The comparison of O&M cost of the Petitioner with other hydropower projects at feasibility as well as EPC stage tariff approved by the Authority shows that the allowed O&M cost ranges between 1.17% to 1.89% of the total project cost The Authority has examined the details of O&M cost provided by the Petitioner and after careful evaluation has assessed US$ 23.960 million on account of its overall per annum O&M cost which is around 1.4% of its total approved project cost and therefore is allowed to the Petitioner. The overall approved O&M cost of US$ 23.960 million has been allocated to Fixed and Variable components as well as local and foreign portions as per request of the Petitioner as mentioned in the table given hereunder.

O&M Cost	Approved	
Fixed O&M Cost	US$ M	%
Foreign Component	8.6256	45%
Local Component	10.5424	55%
Total Fixed O&M	**19.1680**	
Variable O&M cost		
Foreign Component	0.9584	20%
Local Component	3.8336	80%
Total Variable O&M	**4.7920**	
Total O&M Cost	**23.9600**	

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8.3 Insurance during operation phase

8.3.1 The Petitioner has proposed US$ 17.743 million based at 1.35% of the EPC cost on account of per annum Insurance expense. The Petitioner has submitted that the Authority in the feasibility stage tariff determination has allowed insurance during operation at 1% of the EPC cost. Keeping in view the location of the plant in Khyber Pakhtunkhwa and the current market conditions, this amount is too inadequate to cover the insurance cost. The Petitioner has further submitted that in a recent determination for IPP hydropower projects the Authority has allowed annual insurance for the operation period at 1.35% of the EPC cost. The Petitioner has therefore requested that it may also be allowed insurance during operation period at the same rate.

8.3.2 The Authority in the case of other hydropower projects has allowed annual insurance expense for the operation period with maximum ceiling of 1.35% of the EPC Cost. Considering the location of project (in highly seismic zone) and other project specific requirements, the Authority has decided to allow annual insurance expense at 1.35% of the EPC cost as requested by the Peittioner. Accordingly the annual insurance expense approved for the Petitioner works out to be US$ 17.743 million and is being allowed by the Authority subject to adjustment on the basis of actual up to a maximum of 1.35% of the EPC cost on production of verifiable documentary to be provided by the Petitioner at the time of COD.

8.4 Return on Equity (ROE) and Return on Equity During Construction (ROEDC)

8.4.1 The Petitioner has submitted that it has computed ROE at 17% IRR-based return on the invested equity net of Withholding Tax as per the current rate allowed by NEPRA to hydropower IPPs, subject to the condition that if a higher return is allowed to any hydropower project, the same shall be allowed to SKHPL as well without discrimination. The Petitioner has submitted that as the project is to be constructed on Build-Own-Operate-Transfer basis (BOOT) as per the GOP Power Policy 2002, therefore, equity has been redeemed after completion of the debt servicing.

8.4.2 With regard to ROEDC, the Petitioner has submitted that ROEDC has been calculated at 17% starting from the LOS date as per the current policy of the GOP on the amount injected during LOS period i.e. up to financial closing date and thereafter on the estimated equity injection for each year during the construction period. The ROEDC shall be adjustable at COD based on the equity actually injected each year.

8.4.3 The Authority has allowed 17% return on equity IRR-based in other hydropower project therefore, petitioner's request for 17% return on equity is accepted. Regarding ROEDC, the petitioner has calculated ROEDC component of tariff on the basis of equity injected so far i.e. from the date of LOI in the year 2005 up to issuance of LOS in July 2011 as well as estimated equity to be injected during the project construction period. The GOP has allowed special return on equity in case of hydropower projects to be calculated from 30 months before financial close of the project. Since the financial closing date of Suki Kinari is not known at this stage, therefore, the special return to be calculated on actual equity injection 30 months before financial closing date will be considered for necessary adjustment in tariff at COD based on verifiable documentary evidence to be provided by the Petitioner.

8.4.4 Accordingly the ROEDC component of tariff has been calculated by taking into account 72 months (6 years) project construction period as per the practice as indicated in the tariff table attached herewith as Annex-I.

8.5 Water Use Charge

8.5.1 The Petitioner has requested for Ps 15/kWh as Water Use Charge in accordance with the GOP Power Policy 2002. The Authority in other hydropower project has allowed Water Use Charges at Ps. 15/kWh for payment to the respective Province in which such hydropower facility is situated in accordance with the GOP Policy for Power Generation Projects 2002. Accordingly the Petitioner's demand for Ps.15/kWh as Water Use Charge is justified and therefore approved by the Authority.

9. **Whether the claimed Tariff is justified**?

9.1 The Petitioner through the petition requested for approval of tariff of US cents 13.1676/kWh for the first twelve years and US cents 7.3054/kWh for the next eighteen years after payment of debt and US cents 11.6086/kWh on levelized basis over the 30 years tariff control period. However, on the basis of total approved project cost as well as annual operational costs as discussed in the preceding paragraphs, the levelized tariff of the Petitioner works out to be US Cent 10.0678/kWh for the first twelve years, US cents 5.5467/kWh for next eighteen years and levelized tariff over 30 years tariff control period works out to be US cents 8.8145/kWh .

9.2 Though, the tariff approved by the Authority is considerably lower than the proposed tariff by the Petitioner. However, bare look at levelized tariffs of other hydropower projects already approved by the Authority, shows that levelized tariff in the instant case appear to be slightly higher. It is a recognized fact that hydropower tariffs vary widely due to location, project design, hydrology and extent of civil works requirements. Suki Kinari hydropower project with installed capacity of 870.25 MW has been primarily designed as a Peaking Plant i.e. it shall operate at maximum capacity during the two hours of morning peak load of the system and 2 hours during the evening peak load. The design of Suki Kinari hydropower project as peaking plant as per its feasibility has been approved by the Panel of Experts appointed by PPIB. The annual plant capacity factor based on its hydrology works out to be 40.42% whereas the same in other comparable run of the river hydropower projects approved by the Authority is in the range of 52% to 55%. However, on the basis of an apple to apple comparison of levelized tariff while using assumed annual plant factor of 54%, the levelized tariff of Suki Kinari at the same level of costs approved by the Authority works out to be US$ 6.6362/kWh which is well within the range of tariff approved for other hydropower projects at the EPC stage.

9.3 The Authority has also compared the approved capacity charges (Fixed cost) of the Petitioner with the capacity charges of other hydropower projects as under the two part tariff regime, payment to the hydropower IPPs for the capacity charges which comprise of more than 95% of the total tariff, are made on net contracted of a hydropower plant in terms of Rs/kW/Month. The results showed that per month capacity payments of Suki Kinari with its net capacity of 861 MW works out to be Rs. 2804/kW/Month which is well within the range and significantly lower than capacity charges of another hydropower project at EPC stage at Rs. 3288/kW/Month.

9.4 In view of above, the Authority considers that the tariff allowed to the Petitioner in the instant case is quite reasonable and justified.

Order

10. Pursuant to Rule 6 of the NEPRA Licensing (Generation) Rules, 2000 read with section 31(4) of Regulation of Generation, Transmission and Distribution of Electric Power Act, 1997, SK Hydro (Private) Limited (hereinafter referred to as "SKHPL" or the "Company") is allowed to charge the following tariff

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for delivery of electricity to the Central Power Purchasing Agency (CPPA) for onward delivery to Ex-WAPDA distribution companies.

Tariff Components	Year 1-12	Year 13-30	Indexation
Variable Charge (Rs/kWh)			
Variable O&M - Local	0.1224	0.1224	Local CPI
Variable O&M - Foreign	0.0306	0.0306	PKR/US$, US CPI
Water Use Charge	0.1500	0.1500	Local CPI
Fixed Charge (Rs/kW/M)			
Fixed O&M - Local	99.3203	99.3203	Local CPI
Fixed O&M - Foreign	81.2621	81.2621	PKR/US$, US CPI
Insurance	167.1575	167.1575	PKR/US$
Debt Service	1342.3345	-	LIBOR, PKR/US$
Return on Equity	683.4868	726.5304	PKR/US$
Return on equity during construction (ROEDC)	430.3512	430.3512	PKR/US$

i. The reference tariff has been calculated on the basis of net contracted capacity of 861.0 MW and net annual energy production of 3050.438 GWh.

ii. In the above tariff, no adjustment for Carbon Emission Reduction receipts (CERs) has been accounted for. However, upon actual realization of CERs, the same shall be distributed between the Power Purchaser and SKHPL in accordance with the GOP Policy for Power Generation Projects 2002 as amended from time of time.

iii. The above tariff is applicable for a period of thirty (30) years on BOOT basis commencing from Commercial Operation Date (COD).

iv. Debt service will be paid in the first 12 years of commercial operation of plant after COD.

v. Redemption of equity has been allowed after 12 years of commercial operation of the plant.

vi. The reference PKR/Dollar rate has been assumed at 1 USD = 97.40 PKR.

vii. The component wise tariff is indicated at Annex-I

viii. Debt Servicing Schedule is attached as Annex-II

I. <u>One Time Adjustment</u>

a. The Principal repayment and the cost of debt will be adjusted at COD as per the actual borrowing composition and variation in LIBOR at the relevant date during the project construction period.

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b. Interest During Construction (IDC) will be adjusted at COD on the basis of actual debt composition, debt drawdown (not exceeding the amount allowed by the Authority) and applicable 6-months LIBOR during the project construction period allowed by the Authority.

c. In case, the spread on LIBOR is agreed at lower than 450 basis points, the benefit of such reduction in rate will be adjusted in proportion of 60% to the Petitioner and 40% to the consumer through necessary adjustment in tariff at COD.

d. The specific items of project cost to be paid in foreign currency (i.e. US$) will be adjusted at COD on account of actual variation in exchange rate over the reference PKR/US$ exchange rate of Rs. 97.40 on production of verifiable documentary evidence to the satisfaction of the Authority.

e. Custom duty of US$ 13.147 million for the import of plant, machinery and equipment is included in the total EPC Contract price of US$ 1314.297 million and will be adjusted on actual basis at COD upon production of verifiable documentary evidence to the satisfaction of the Authority.

f. The reference civil works cost for the local component amounting to Rs. 23977.467 million including the cost of tunnels will be adjusted due to variation in the following reference price of material (Labour, Fuel, Cement and Steel) based on relevant monthly indices/cost of each aforementioned item published by the Pakistan Institute of Cost and Contracts (PICC).

Item	Base or Reference Rate	Basis
Labor	Rs. 680/day	Minimum wages for Foreman as published by PICC, Mansehra.
Fuel	Rs. 109.8083/litre	Average of price of one litre of petrol plus five litres of HSD as published by PICC, Mansehra.
Cement	Rs. 9000/ton	Price of Cement as published by PICC, Mansehra.
Reinforced Steel	Rs. 84455.2733/ton	Average of price oof two tons of Mild Steel rebar 1/2 inch dia(deformed) Grade 60 plus one ton of Mild Steel rebar 1/2 inch dia (deformed) Grade 40 as published by PICC, Mansehra.

The 60% of the total civil works cost will remain fixed whereas 40% will be adjusted based on individual composition of each material (Labour, Fuel, Cement and Steel) as per the following formula;

$$Pn = 0.60 + 0.07*(Ln/Lo) + 0.20*(Fn/Fo) + 0.05*(Cn/Co) + 0.08*(Sn/So)$$

Where;

"Pn" is the adjustment factor to be applied to the estimated value of the work carried out in Month "n".

"Lo", "Fo", "Co" and "So" are the base cost indices or reference prices of Labour, Fuel, Cement and Steel as given in the above table; and

"Ln", "Fn", "Cn" and "Sn" are the cost indices or prices corresponding to the above cost elements in the Month "n".

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g. Withholding Tax @6% on local supplies/services is included in the total EPC price. However, variation in Withholding Tax on account of change in the existing rate of withholding tax will be allowed based on actual subject to provision of authentic documentary evidence to the satisfaction of the Authority.

h. Cost of land and resettlement will be adjusted in accordance with the Hydropower Mechanism based on verifiable documentary evidence at COD.

i. Cost of environment protection and ecology will be adjusted as per actual subject to the maximum of US$ 9.247 million on production of verifiable documentary evidence to be provided by the Petitioner at COD.

j. Insurance during construction will be adjusted at COD based on actual subject to the maximum of 2.75% of the adjusted and approved EPC cost upon production of verifiable documentary evidence to the satisfaction of the Authority.

k. Financial charges will be adjusted at COD on the basis of actual subject to the maximum of 3% of the total debt allowed (excluding the impact of interest during construction, Sinosure fee, if any, and financial charges) on production of verifiable documentary evidence.

l. Return on Equity (ROE) and Return on Equity During Construction (ROEDC) will be adjusted at COD on the basis of actual equity injections and PKR/US$ exchange rate variation (within the overall equity allowed by the Authority at COD) during the project construction period allowed by the Authority.

m. The adjustment for Special return on equity in tariff for the 30 months period will be allowed at COD on the basis of actual equity injection prior to the construction start date on the basis of verifiable documentary evidence to be provided by the Petitioner.

n. If the Petitioner is required to make payment of Overseas Investment Insurance Fee (Sinosure Fee) on debt, the same shall be adjusted in tariff based on actual subject to the maximum of 7% of the total debt allowed by the Authority at COD upon production of verifiable documentary evidence to be provided by the Petitioner.

o. The reference tariff table shall be revised at COD while taking in to account the above adjustments. The Petitioner shall submit its request to the Authority within 90 days of COD for necessary adjustments in tariff.

II. Pass-Through Items

No provision for income tax has been accounted for in the tariff. If the power producer is obligated to pay any tax, the exact amount paid by the power producer (the Company) shall be reimbursed by the Power Purchaser to the Company on production of original receipts. This payment should be considered as pass-through payment (Rs/kW/M) spread over a twelve (12) months period in addition to fixed charges in the Reference Tariff.

Withholding tax on dividends is also a pass through item just like other taxes as indicated in the government Guidelines. Withholding tax shall be paid @ 7.5% of the return on equity (including return

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on equity during construction). The Power Purchaser shall make payment on account of withholding tax at the time of actual payment of dividend subject to maximum of 7.5% of 17% return on equity according to the following formula:

Withholding Tax Payable = $[\{17\% * (E_{(Ref)} - E_{(Red)})\} + ROEDC_{(Ref)}] \times 7.5\%$

Where:

$E_{(Ref)}$	=	Adjusted Reference Equity at COD
$E_{(Red)}$	=	Equity Redeemed
$ROEDC_{(Ref)}$	=	Adjusted Reference Return on Equity during Construction

In case the Company does not declare a dividend in any particular year or only declares a partial dividend, then the difference in the withholding tax amount (between what has been paid in that year and the total entitlement as per the Net Return on Equity) would be carried forward and accumulated so that the Company is able to recover the same as a pass through item from the Power Purchaser in future on the basis of the total dividend payout.

III. Hydrological Risk

Hydrological Risk shall be borne by the Power Purchaser in accordance with the GoP Policy for Power Generation Projects 2002.

IV. Indexation

The following indexation shall be applicable to the reference tariff:

i) Indexation applicable to O&M

The Variable O&M cost is based on 80% local and20% foreign expense. The Fixed O&M cost is based on 55% local and 45% foreign expense. The local part of O&M will be adjusted on account of local Inflation (CPI), whereas the foreign part of O&M will be adjusted on account of Rupee/Dollar exchange rate variation and US CPI. Quarterly adjustment for local inflation, foreign inflation and exchange rate variation will be made on 1st July, 1st October, 1st January & 1st April respectively on the basis of the latest available information with respect to local CPI (General) as notified by Federal Burea of Statistics Pakistan, US CPI notified by US bureau of labor statistics and revised TT & OD Selling rate of US Dollar notified by the National Bank of Pakistan. The mode of indexation will be as under:

a. Fixed O&M

$F\ O\&M_{(LREV)} = O\&M_{(LREF)} * CPI_{(REV)} / 183.58$

$F\ O\&M_{(FREV)} = O\&M_{(FREF)} * USCPI_{(REV)} / 233.596 * ER_{(REV)} / 97.40$

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Where:

F O&M $_{(LREV)}$	=	The revised applicable Fixed O&M local component of tariff indexed with local CPI.
F O&M $_{(FREV)}$	=	The revised applicable Fixed O&M foreign component of tariff indexed with US CPI and exchange rate variation.
O&M$_{(LREF)}$	=	The reference fixed O&M local component of tariff for the relevant period.
O&M$_{(FREF)}$	=	The reference fixed O&M foreign component of tariff for the relevant period.
CPI $_{(REV)}$	=	The Revised Consumer Price Index (General) as notified by the Federal Bureau of Statistics, Pakistan for the relevant month.
CPI $_{(REF)}$	=	The Reference Consumer Price Index (General) of July 2013 (183.58) notified by the Federal Bureau of Statistics, Pakistan.
US CPI $_{(REV)}$	=	The Revised US Consumer Price Index (All Urban Consumers) notified by the Bureau of Labor Statistics.
US CPI $_{(REF)}$	=	Reference US CPI (All Urban Consumers) notified by the Bureau of Labor Statistics for the month of July 2013.
ER$_{(REV)}$	=	The revised TT and OD selling rate of US dollar as notified by the National Bank of Pakistan.

b. Variable O&M

V O&M $_{(LREV)}$ = O&M$_{(LREF)}$ * CPI $_{(REV)}$ / 183.58
V O&M $_{(FREV)}$ = O&M$_{(FREF)}$ * USCPI $_{(REV)}$/ 233.596 * ER $_{(REV)}$/97.40

Where:

V O&M $_{(LREV)}$	=	The revised applicable Variable O&M local component of tariff indexed with local CPI.
V O&M $_{(FREV)}$	=	The revised applicable Variable O&M foreign component of tariff indexed with US CPI and exchange rate variation.
O&M $_{(LREF)}$	=	The reference variable O&M local component of tariff.
O&M $_{(FREF)}$	=	The reference variable O&M foreign component of tariff.
CPI $_{(REV)}$	=	The Revised Consumer Price Index (General) as notified by the Federal Bureau of Statistics, Pakistan for the relevant month.
CPI $_{(REF)}$	=	The Consumer Price Index (General) of July 2013. notified by the Federal Bureau of Statistics, Pakistan.
US CPI $_{(REV)}$	=	The Revised US Consumer Price Index (All Urban Consumers) notified by the Bureau of Labor Statistics.
US CPI $_{(REF)}$	=	Reference US CPI (All Urban Consumers) notified by the Bureau of Labor Statistics for the month of July 2013.
ER$_{(REV)}$	=	The revised TT and OD selling rate of US dollar as notified by the National Bank of Pakistan.

ii) Water Use Charge

Water Use Charge will be paid on units delivered basis and will be indexed with Consumer Price Index (CPI General) annually from the date of COD. The first such

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adjustment shall be due after one year of commercial operation date (COD), according to the formula:

$$WUC_{(REV)} = WUC_{(REF)} * CPI_{(REV)} / 183.58$$

Where;

$WUC_{(REV)}$	=	The revised Water Use Charge component of tariff indexed with Consumer Price Index (General).
$WUC_{(REF)}$	=	The reference Water Use Charge component of tariff.
$CPI_{(REV)}$	=	The Revised Consumer Price Index (General) notified by the Federal Bureau of Statistics, Pakistan for the relevant month.
$CPI_{(REF)}$	=	The reference Consumer Price Index (General) of July 2013 notified by the Federal Bureau of Statistics, Pakistan.

iii) <u>Insurance</u>

Insurance cost component of tariff, in case insurance is denominated in foreign currency, will be adjusted on account of PKR/US$ exchange rate variation at COD and thereafter on an annual basis at actual subject to the maximum of 1.35% of the EPC cost on production of verifiable documentary evidence by the Petitioner, according to the following formula:

$$Ins_{(REV)} = Ins_{(REF)} * ER_{(REV)} / ER_{(REF)}$$

Where;

$Ins_{(REV)}$	=	Revised Insurance cost component of tariff adjusted with the exchange rate variation (PKR/US$)
$Ins_{(REF)}$	=	Reference insurance cost component of tariff.
$ER_{(REV)}$	=	The revised TT & OD selling rate of US dollar as notified by the National Bank of Pakistan.
$ER_{(REF)}$	=	The reference TT &OD selling rate of US dollar as notified by the National Bank of Pakistan.

iv) <u>Adjustment for LIBOR variation</u>

The interest part of fixed charge component will remain unchanged throughout the term except for the adjustment due to exchange rate variation and variation in 6 months LIBOR, while spread on LIBOR remaining the same, according to the following formula:

$$\Delta I = P_{(REV)} * (LIBOR_{(REV)} - 0.73\%) / 2$$

Where;

ΔI = the variation in interest charges applicable corresponding to variation in six-month LIBOR. ΔI can be positive or negative

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depending upon whether LIBOR $_{(REV)}$ > or < 0.41326%. The interest payment obligation will be enhanced or reduced to the extent of Δ I for each period under adjustment applicable on bi-annual basis.

P $_{(REV)}$ = the outstanding principal (as indicated in the attached debt service schedule to this order at Annex-II) on a semi-annual basis at the relevant calculations dates.

v) Return on Equity

Return on equity (ROE) as well as Return on Equity during Construction (ROEDC) component of tariff shall be adjusted for variation in PKR/US$ exchange rate according to the following formula:

$$ROE_{(REV)} = ROE_{(REF)} * ER_{(REV)}/ER_{(REF)}$$
$$ROEDC_{(REV)} = ROEDC_{(REF)} * ER_{(REV)}/ER_{(REF)}$$

Where;

$ROE_{(REV)}$	=	Revised Return on Equity component of tariff expressed in Rs/kW/M adjusted with exchange rate variation.
$ROEDC_{(REV)}$	=	Revised Return on Equity during Construction component of tariff in Rs/kW/M adjusted with exchange rate variation.
$ROE_{(REF)}$	=	Reference Return on Equity component of tariff expressed in Rs/kW/M.
$ROEDC_{(REF)}$	=	Reference Return on Equity during Construction component of tariff expressed in Rs/kW/M.
$ER_{(REV)}$	=	Revised TT and OD selling rate of US dollar as notified by the National Bank of Pakistan.
$ER_{(REF)}$	=	Reference TT and OD selling rate of US dollar.

Note: -

Adjustment on account of inflation, foreign exchange rate variation and LIBOR variation will be approved by the Authority within fifteen working days after receipt of complete information from the Petitioner through its request for adjustment in tariff in accordance with the requisite indexation mechanism stipulated hereinabove.

V. Other Terms and Conditions of Tariff

Design & Manufacturing Standards:

Hydel Power Generation system shall be designed, manufactured and tested in accordance with the latest IEC standards or other equivalent standards. All plant and equipment shall be new and of standard quality.

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Power Curve of the Hydel Power Complex:

The power curve of the Hydel Power plant shall be verified by the Power Purchaser, as part of the Commissioning tests according to the latest IEC standards and shall be used to measure the performance of the hydel generating units.

Emissions Trading/Carbon Credits:

The Petitioner shall process and obtain emissions/carbon credits expeditiously and credit the proceeds to the Power Purchaser as per the policy issued by the Federal Government.

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Annex-I

SK HYDRO (Pvt) Limited
REFERENCE TARIFF

Year	Variable O&M Local	Variable O&M Foreign	Water Use Charge	Fixed O&M Local	Fixed O & M Foreign	Insurance	Return on Equity	ROE During Construction	Loan Repayment	Interest Charges	Total Tariff
	Rs./kWh	Rs/kWh	Rs./kWh	Rs. / kW/M	Rs. / kW/M	Rs. / kW/M	Rs. / kW/M	Rs. / kW/M	Rs. / kW/M	Rs./kW/M	Rs. / kWh
1	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	758.9290	583.4055	9.8061
2	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	796.6752	545.6593	9.8061
3	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	836.2987	506.0358	9.8061
4	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	877.8929	464.4416	9.8061
5	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	921.5559	420.7786	9.8061
6	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	967.3905	374.9440	9.8061
7	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	1,015.5047	326.8298	9.8061
8	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	1,066.0120	276.3225	9.8061
9	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	1,119.0313	223.3032	9.8061
10	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	1,174.6875	167.6470	9.8061
[illegible]	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	1,233.1119	109.2226	9.8061
12	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	683.4868	430.3512	1,294.4421	47.8924	9.8061
13	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
14	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
15	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
16	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
17	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
18	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
19	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
20	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
21	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
22	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
23	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
24	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
25	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
26	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
27	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
28	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
29	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
30	0.1224	0.0306	0.1500	99.3203	81.2621	167.1575	726.5304	430.3512			5.4025
Levelized Tariff	**0.1224**	**0.0306**	**0.1500**	**99.3203**	**81.2621**	**167.1575**	**695.4189**	**430.3512**	**687.9342**	**282.2935**	**8.5853**

Levelized Tariff (1-30 years) discounted at 10% per annum = US Cents 8.8145/kWh at reference exchange rate of 1US$=Rupees 97.40.

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Annex-II

SK HYDRO (Pvt) Limited

Debt Servicing Schedule

Period	Foreign Debt: Principal Million $	Foreign Debt: Repayment Million $	Foreign Debt: Mark-Up Million $	Foreign Debt: Balance Million $	Foreign Debt: Debt Service Million $	Annual Principal Repayment Million US$	Annual Interest Million US$	Annual Debt Servicing Million US$	Annual Principal Repayment Rs./kW/M	Annual Interest Rs./kW/M	Annual Debt Servicing Rs./kW/M
	1,280.2771	39.7897	31.4517	1,240.4874	71.2414						
1	1,240.4874	40.7672	30.4742	1,199.7202	71.2414	80.5569	61.9259	142.4827	758.9290	583.4055	1,342.3345
	1,199.7202	41.7687	29.4727	1,157.9515	71.2414						
2	1,157.9515	42.7948	28.4466	1,115.1567	71.2414	84.5635	57.9193	142.4827	796.6752	545.6593	1,342.3345
	1,115.1567	43.8461	27.3953	1,071.3107	71.2414						
3	1,071.3107	44.9232	26.3181	1,026.3874	71.2414	88.7693	53.7134	142.4827	836.2987	506.0358	1,342.3345
	1,026.3874	46.0268	25.2145	980.3606	71.2414						
4	980.3606	47.1575	24.0838	933.2031	71.2414	93.1844	49.2984	142.4827	877.8929	464.4416	1,342.3345
	933.2031	48.3160	22.9253	884.8870	71.2414						
5	884.8870	49.5030	21.7384	835.3841	71.2414	97.8190	44.6637	142.4827	921.5559	420.7786	1,342.3345
	835.3841	50.7191	20.5223	784.6650	71.2414						
6	784.6650	51.9651	19.2763	732.6999	71.2414	102.6841	39.7986	142.4827	967.3905	374.9440	1,342.3345
	732.6999	53.2416	17.9997	679.4583	71.2414						
7	679.4583	54.5496	16.6918	624.9087	71.2414	107.7912	34.6915	142.4827	1,015.5047	326.8298	1,342.3345
	624.9087	55.8897	15.3517	569.0190	71.2414						
8	569.0190	57.2627	13.9787	511.7563	71.2414	113.1524	29.3304	142.4827	1,066.0120	276.3225	1,342.3345
	511.7563	58.6694	12.5720	453.0869	71.2414						
9	453.0869	60.1107	11.1307	392.9762	71.2414	118.7801	23.7026	142.4827	1,119.0313	223.3032	1,342.3345
	392.9762	61.5874	9.6540	331.3888	71.2414						
10	331.3888	63.1004	8.1410	268.2884	71.2414	124.6878	17.7950	142.4827	1,174.6875	167.6470	1,342.3345
	268.2884	64.6505	6.5909	203.6379	71.2414						
11	203.6379	66.2387	5.0026	137.3992	71.2414	130.8893	11.5935	142.4827	1,233.1119	109.2226	1,342.3345
	137.3992	67.8660	3.3754	69.5332	71.2414						
12	69.5332	69.5332	1.7082	0.0000	71.2414	137.3992	5.0836	142.4827	1,294.4421	47.8924	1,342.3345

Reference LIBOR = 0.41326% + Spread 4.50%

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